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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/622,710	07/18/2003	Rodney John Davies	SAND 2774	2958

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SMITH-HILL AND BEDELL  
12670 N W BARNES ROAD  
SUITE 104  
PORTLAND, OR 97229

EXAMINER
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BOMAR, THOMAS S

ART UNIT	PAPER NUMBER
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3672

DATE MAILED: 06/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/622,710

Applicant(s)

DAVIES, RODNEY JOHN

Examiner

Shane Bomar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION*****Specification***

1. 35 U.S.C. 112, first paragraph, requires the specification to be written in "full, clear, concise, and exact terms." The specification is replete with terms that are not clear, concise and exact. The specification should be revised carefully in order to comply with 35 U.S.C. 112, first paragraph. Examples of some unclear, inexact or verbose terms used in the specification are: when referring to Figures 3 and 5, it is unclear how shaft 54 could project into aperture 60 as stated in paragraph [0023], since 60 appears to be a small diameter hose; it is unclear how the laser beam reflects off of another hose, or line, 80 which is referred to as the target in paragraph [0023]; the end of paragraph [0020] states that a video monitor 40 and a control console 42 are mounted on frame 16, although it appears that 40 is the housing for the drilling assembly and 42 appears to be a cover for said housing, Figure 3a is not a part of the submitted drawings, etc.
2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: (1) claim 9 states that a check valve maintains the prevailing pressure for the guidance system; however, the specification and the drawings are silent as to any of the valves being check valves (see for example, the last two lines of paragraph [0023]); (2) claim 10 states that the boring head is 200-800mm in diameter, although the specification and the drawings are silent to this limitation; and (3) claim 11 states that the boring rate is 9-95 ft/hr, although the specification and the drawings are again silent to this limitation.

***Claim Objections***

3. Claims 3 and 8 are objected to because of the following informalities: the recitation of “the ram” in claim 8 lacks proper antecedent basis in claim 7 because a pair of rams was previously recited, therefore it is unclear whether a new ram is being claimed or if one of the pair of rams is being referred to; the recitation of “system s claimed” in claim 3 should most likely be --system as claimed--. Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-5, 7-9, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by US patent 5,296,915 to Akesaka.

Regarding claim 1, Akesaka discloses a guidance system for the boring head of a tunneling machine of the type which bores in a selected direction and inclination using laser beam guidance having the endmost part of the drive to the boring bit adjustable in two directions at 90 degrees wherein, the endmost part of the drive has a target 50 for the laser beam 40 (see Figs. 1A, 3, and 4, and col. 5, line 40 through col. 6, line 52), means 52 to convey an image of the target and the laser strike position thereon to an operator situated remotely from the boring head and input means for the operator to adjust the direction of the endmost part of the drive (see col. 6, line 53 through col. 7, line 57). It is noted that the term micro-tunneling machine has not

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been defined within claim 1, therefore that limitation has not been given any patentable weight and the claim has been examined in light of only the structural limitations presented.

Regarding claim 2, the means to convey the image is a video camera (see col. 6, lines 64-68).

Regarding claim 3, the target is a surface against which the laser is visible in contrast (see col. 6, line 64 through col. 7, line 2).

Regarding claim 4, the target has markings to help the operator to center the direction of the boring bit (see Fig. 1B and col. 7, lines 12-57).

Regarding claim 5, the input means for the operator inherently comprises switches for controlling adjusters 22 which act on the drive shaft (see col. 6, line 64 through col. 7, line 11), wherein it is inherent that the input means be switches because the operator is at a remote location and switches are a notoriously known way for operating machinery from a remote location.

Regarding claims 7-9, the adjusters 22 are a pair of rams (see col. 5, lines 49-52) inherently connectable to a supply of water and to a drain, as is notoriously known in the hydraulic ram art, wherein the rams have in and out ports and further wherein a check valve will maintain prevailing pressure in the rams, again as is notoriously known in the hydraulic ram art for the successful operation of the rams.

Regarding claim 11, the bore rate is inherently between 9-95 ft/hr since it is notoriously known in the art that bore rate is largely dependent on the type of earth being bored (i.e., rock or soil), therefore the apparatus disclosed by Akasaka could operate in this range depending on the type of formation being bored.

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6. Claims 1-5, 7-9, 11, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by US patent 5,501,548 to Hayashi et al.

Regarding claim 1, Hayashi et al disclose a guidance system for the boring head of a tunneling machine of the type which bores in a selected direction and inclination using laser beam guidance having the endmost part of the drive to the boring bit adjustable in two directions at 90 degrees wherein, the endmost part of the drive has a target 10 for the laser beam 9 (see Fig. 1 and col. 5, lines 1-31), means 15 to convey an image of the target and the laser strike position thereon to an operator 24 situated remotely from the boring head and input means 26 for the operator to adjust the direction of the endmost part of the drive (see Fig. 3 and col. 6, line 17 through col. 7, line 6). It is noted that the term micro-tunneling machine has not been defined within claim 1, therefore that limitation has not been given any patentable weight and the claim has been examined in light of only the structural limitations presented.

Regarding claim 2, the means to convey the image is a video camera 15 (see col. 6, lines 17-29).

Regarding claim 3, the target is a surface against which the laser is visible in contrast (see col. 5, lines 51-55).

Regarding claim 4, the target has markings to help the operator to center the direction of the boring bit (see Fig. 4 and col. 5, lines 25-55).

Regarding claim 5, the input means for the operator inherently comprises switches for controlling adjusters 3a and 3b which act on the drive shaft (see col. 5, line 56 through col. 6, line 14), wherein it is inherent that the input means be switches because the operator is at a

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remote location and switches are a notoriously known way for operating machinery from a remote location.

Regarding claims 7-9, the adjusters 3a and 3b are a pair of rams (see Fig. 2 and col. 5, line 56 through col. 6, line 14) inherently connectable to a supply of water and to a drain, as is notoriously known in the hydraulic ram art, wherein the rams have in and out ports and further wherein a check valve will maintain prevailing pressure in the rams, again as is notoriously known in the hydraulic ram art for the successful operation of the rams.

Regarding claim 11, the bore rate is inherently between 9-95 ft/hr since it is notoriously known in the art that bore rate is largely dependent on the type of earth being bored (i.e., rock or soil), therefore the apparatus disclosed by Hayashi et al could operate in this range depending on the type of formation being bored.

Regarding claim 12, the input means includes input signals from an imaging system that uses the camera image to compare the bore direction indicated by the target with the laser beam direction and operates switches (see col. 6, lines 17-67) until the operator assumes manual control at such time where the laser spots have moved a center distance from the origin (see col. 6, lines 62-67).

7. Claims 1 and 5-12 are rejected under 35 U.S.C. 102(b) as being anticipated by US patent 5,361,854 to Tull et al.

Regarding claim 1, Tull et al disclose a guidance system for the boring head of a micro-tunneling machine (see col. 5, lines 21-24) of the type which bores in a selected direction and inclination using laser beam guidance having the endmost part of the drive to the boring bit adjustable in two directions at 90 degrees wherein, the endmost part of the drive has a target 118

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for the laser beam 88d (see Figs. 1 and 2, col. 4, line 55 through col. 5, line 17, and col. 6, lines 36-63), means 109 to convey an image of the target and the laser strike position thereon to an operator looking at screen 122 situated remotely from the boring head and input means 124 for the operator to adjust the direction of the endmost part of the drive (see Fig. 3 and 7, and col. 6, line 47 through col. 7, line 26).

Regarding claims 5 and 6, the input means comprises a joystick 124 for controlling the adjusters 40 and 42 that act on the drive shaft 12 (see Figs. 1-2 and 7, and col. 4, line 66 through col. 5, line 17).

Regarding claims 7-9, the adjusters 40 and 42 are a pair of rams (see Fig. 1 and col. 5, lines 1-17) inherently connectable to a supply of water and to a drain, as is notoriously known in the hydraulic ram art, wherein the rams have in and out ports and further wherein a check valve will maintain prevailing pressure in the rams, again as is notoriously known in the hydraulic ram art for the successful operation of the rams.

Regarding claim 10, the boring head of Tull et al is inherently 200-800mm in diameter since it is notoriously known that micro-tunneling involves diameters below 2 meters, and since the applicant has not shown any criticality as to why the diameter must lie within this range.

Regarding claim 11, the bore rate is inherently between 9-95 ft/hr since it is notoriously known in the art that bore rate is largely dependent on the type of earth being bored (i.e., rock or soil), therefore the apparatus disclosed by Tull et al could operate in this range depending on the type of formation being bored.

Regarding claim 12, the input means includes input signals from an imaging system that uses the camera image to compare the bore direction indicated by the target with the laser beam



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direction and operates switches until the operator assumes manual control (see col. 7, lines 20-26).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akesaka or Hayashi et al in view of Tull et al.

Both Akesaka and Hayashi et al teach the guidance system for a boring head of claim 1 that includes switches for controlling adjusters that act on the drive shaft. However, neither reference teaches that the switches are grouped for joystick operation or that the boring head is 200-800 mm in diameter.

Tull et al also teaches the guidance system for a boring head of claim 1 that includes switches for controlling adjusters that act on the drive shaft (see above 102 rejections in view of Tull et al). It is further taught that the switches are grouped for joystick operation (see Figs. 1-2 and 7, and col. 4, line 66 through col. 5, line 17), and that the boring head of is inherently 200-800mm in diameter since it is notoriously known that micro-tunneling involves diameters below 2 meters, wherein the applicant has not shown any criticality as to why the diameter must lie within this range. It would have been obvious to one of ordinary skill in the art, having the teachings of either Akesaka or Hayashi et al and Tull et al before him at the time the invention was made, to modify the guidance system taught by Akesaka or Hayashi et al to include the

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joystick operation and micro-tunneling boring head of Tull et al, in order to obtain better control of the steering of the boring head with the joystick. One would have been motivated to make such a combination since Tull et al have shown it to be notoriously known in the art to control the steering of a micro-tunneling machine with a joystick for easier operation, and because Tull et al have shown it to be notoriously known in the art that guidance systems can be used in different types of earth boring apparatus (See col. 5, lines 21-24 of Tull et al).

10. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tull et al in view of Akesaka or Hayashi et al.

Tull et al teaches the guidance system for a boring head of claim 1 that includes a means to convey an image of the target and the laser strike position to an operator. It is not expressly taught that the means to convey is a video camera.

Both Akesaka and Hayashi et al also teach the guidance system for a boring head of claim 1 that includes a means to convey an image of the target and the laser strike position to an operator. It is further taught that the means to convey the image is a video camera 15 (see col. 6, lines 64-68 of Akesaka or col. 6, lines 17-29 of Hayashi et al). It would have been obvious to one of ordinary skill in the art, having the teachings of Tull et al and Akesaka or Hayashi et al before him at the time the invention was made, to modify the guidance system taught by Tull et al to include the video camera of Akesaka or Hayashi et al, in order to obtain an actual real-time image of the laser as it hits the target. One would have been motivated to make such a combination since both Akesaka and Hayashi et al have shown it to be notoriously known in the art to use a video camera to display the image of the laser as it hits the target as it is in the borehole.

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Regarding claim 3, the target is a surface against which the laser is visible in contrast (see col. 6, line 64 through col. 7, line 2 of Akesaka or col. 5, lines 51-55 of Hayashi et al).

Regarding claim 4, the target has markings to help the operator to center the direction of the boring bit (see Fig. 1B and col. 7, lines 12-57 of Akesaka or Fig. 4 and col. 5, lines 25-55 of Hayashi et al).

### ***Conclusion***

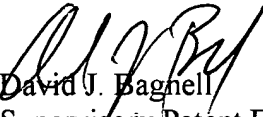
11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Williamson et al teach a tunneling guidance system utilizing a laser and a video camera. Baumann et al, Bjor, Filipowski et al, Gibson et al, Pine, Prince, Saint-Pierre et al, Schnell, Terasawa, and Weber teach other laser guided drilling or tunneling tools of interest. DiMillo teaches that a micro-tunneling boring head has a diameter less than 2 meters.


12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shane Bomar whose telephone number is 571-272-7026. The examiner can normally be reached on Monday - Thursday from 7:00am to 4:30pm. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on 571-272-6999. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
David J. Bagnell  
Supervisory Patent Examiner  
Art Unit 3672

tsb   
May 26, 2005